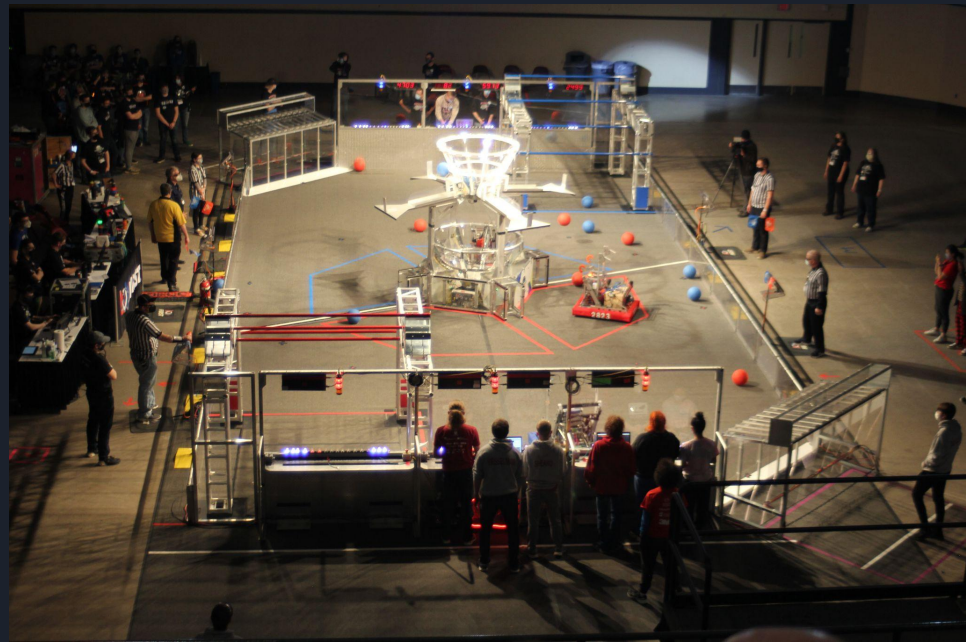
FIRST Robotics 2022 Season

FRC 7578 - The Quantum Misfits

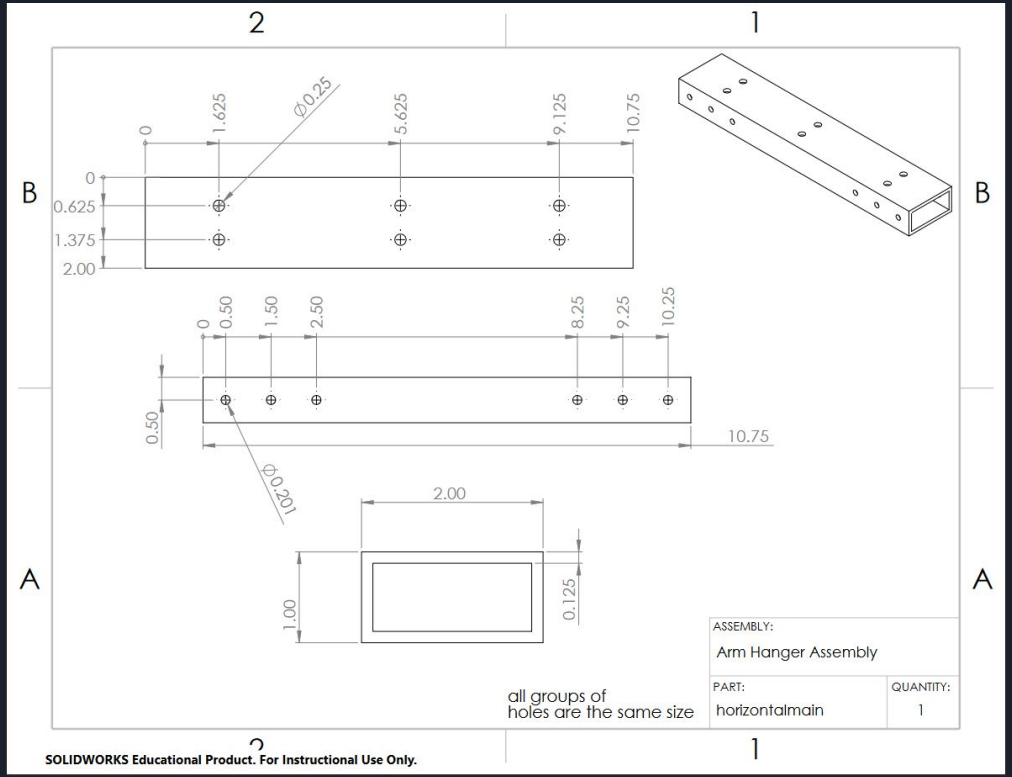
What is FIRST Robotics?

- STEM based student led engineering and design
- “Combining the excitement of sport with the rigors of science and technology.”
- Strict rules with limited resources and time
  - 8 weeks from game reveal to competition
  - 136 page rule book
    - Robot restrictions
    - Game rules
    - Human regulation
    - Field element specifications.



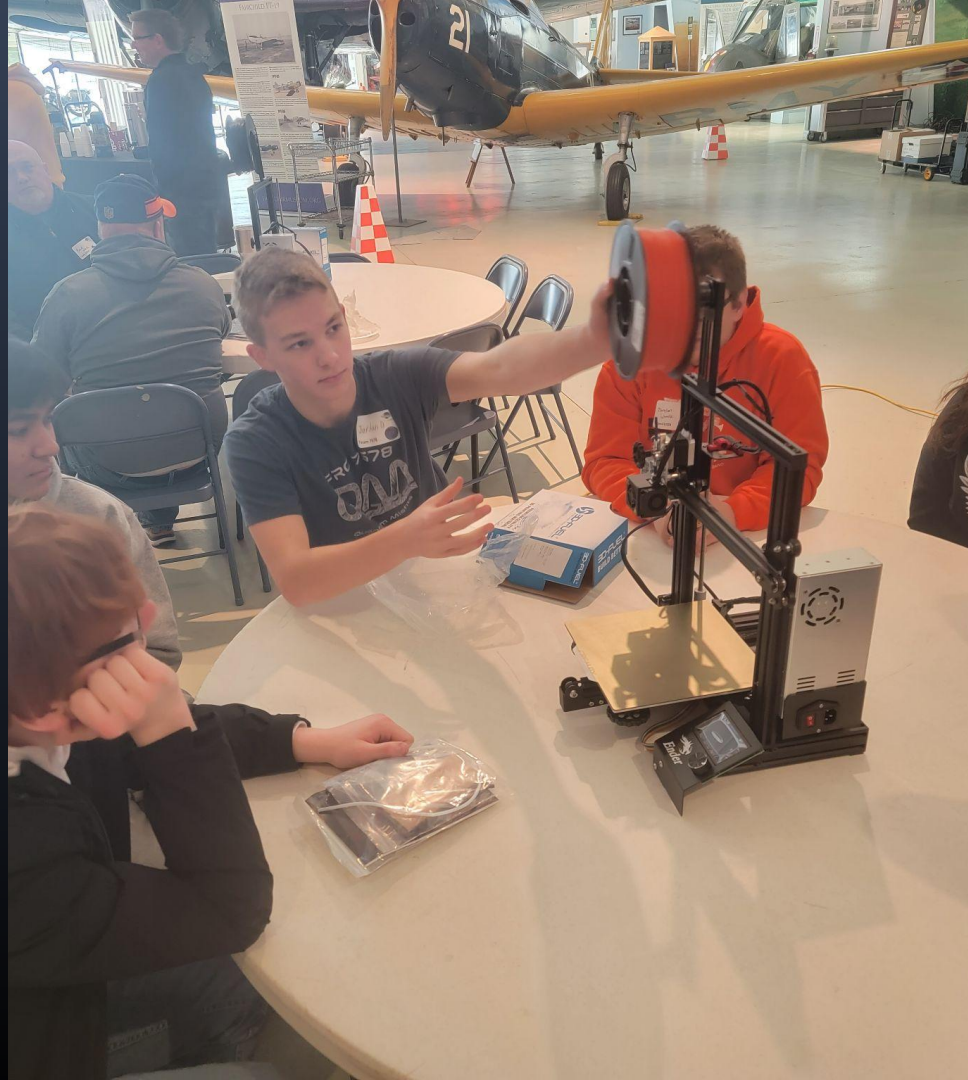
Pre-season

- Taught new students how to safely use machines
  - Mill
  - Laythe
  - Bandsaw
  - Grind Wheel
  - Table saw
- Practiced 3D modeling using SOLIDWORKS
- Used the old robot as a model for wiring, piece mounting, belts, etc.
- Activity nights for team bonding
  - Food
  - Games
  - Video from past seasons



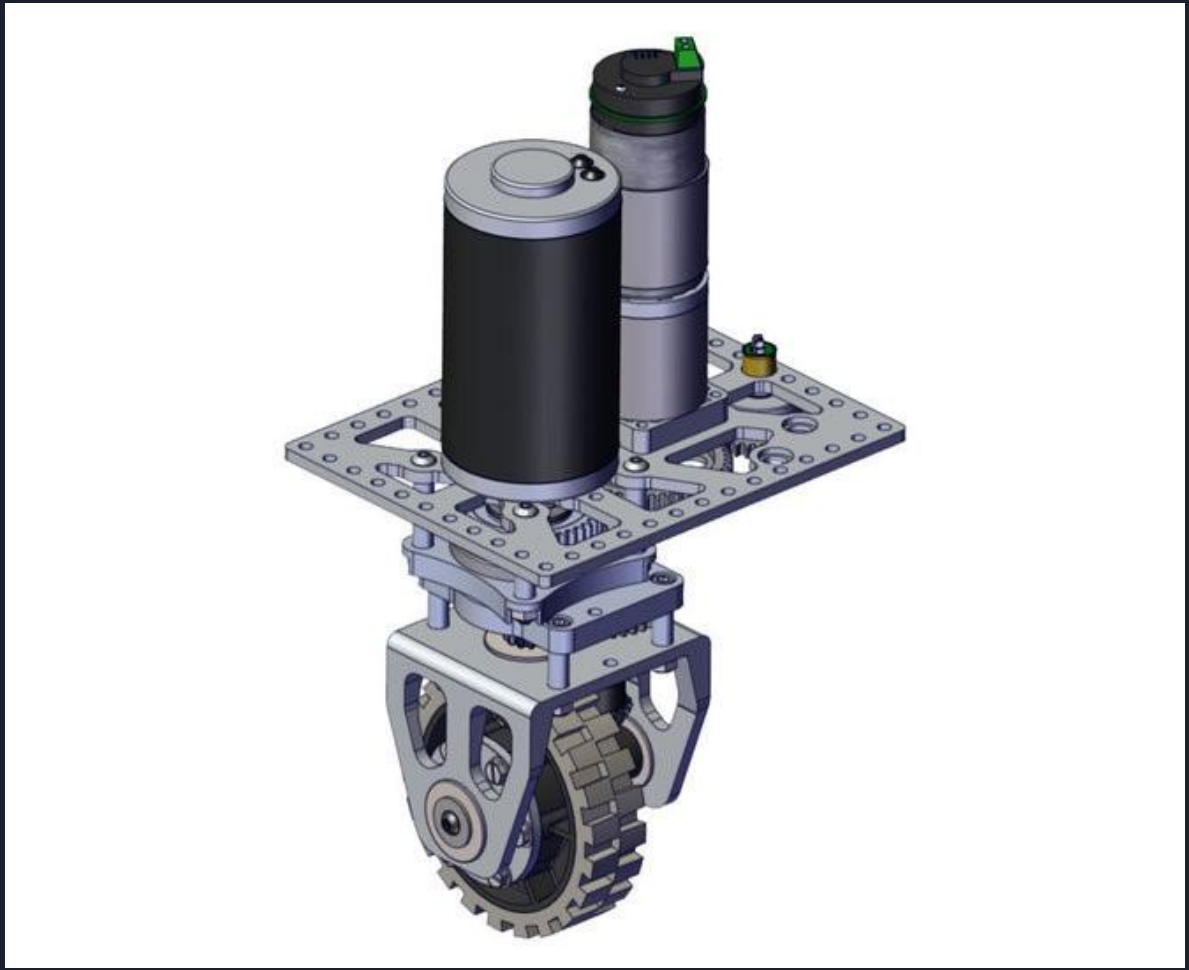
Kickoff Event

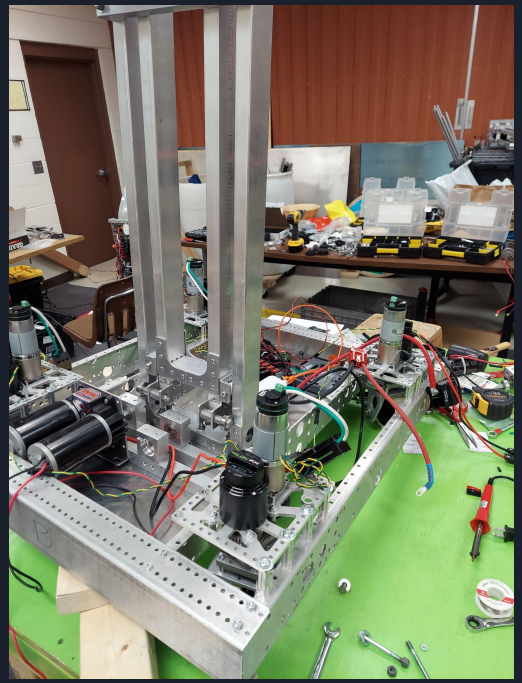
- Held at the Fargo Air Museum
- World-wide live stream of the game reveal
- Marked the start of the build season
- Got a free Ender 3 3D printer

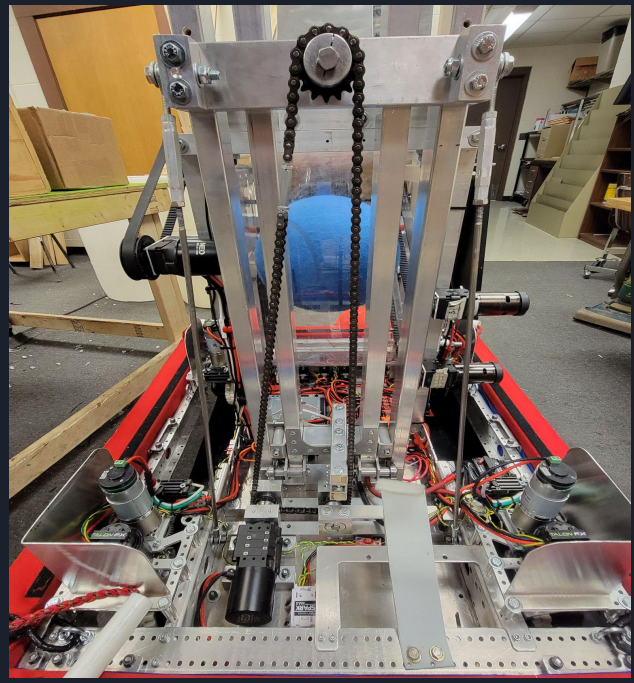


Early season

- Focused on frame, wheels, and elevator
- Wheels
  - Swerve drive
  - Full speed in any direction
- Elevator
  - Single stage
  - Easily lifts itself (~120 lbs)



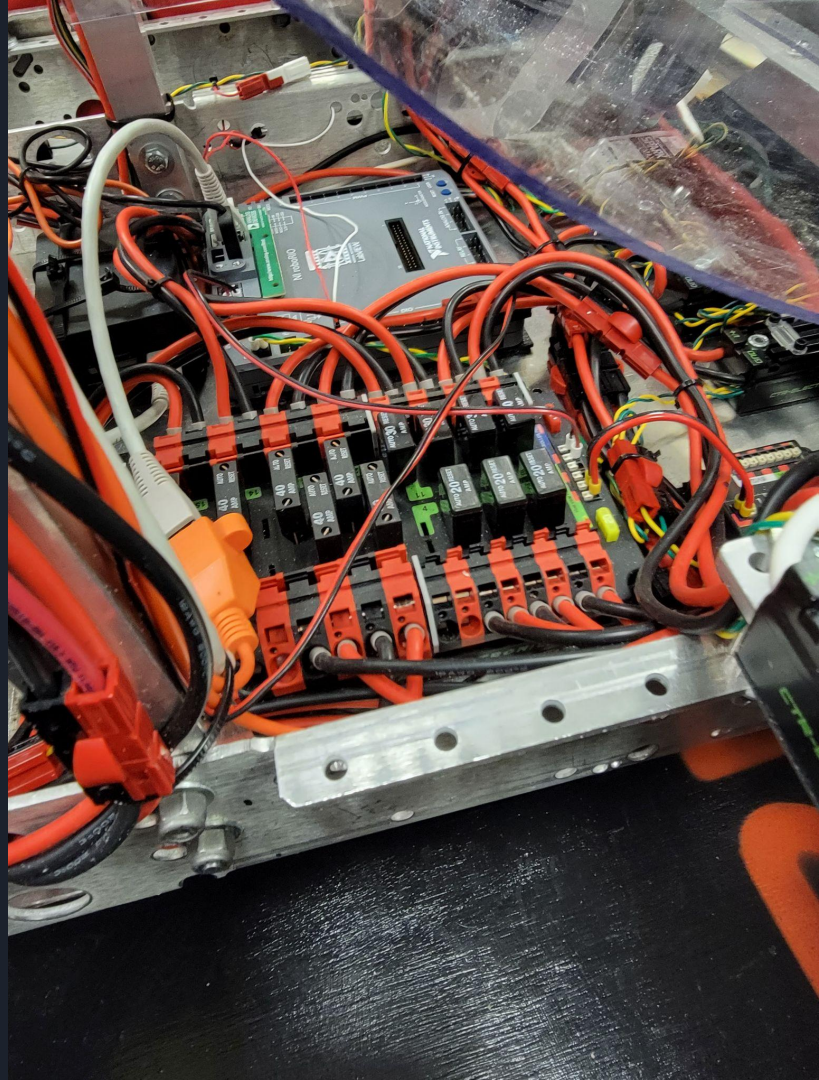


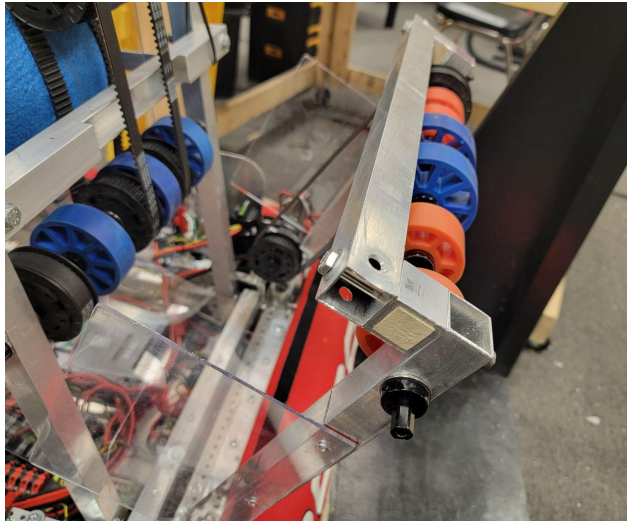


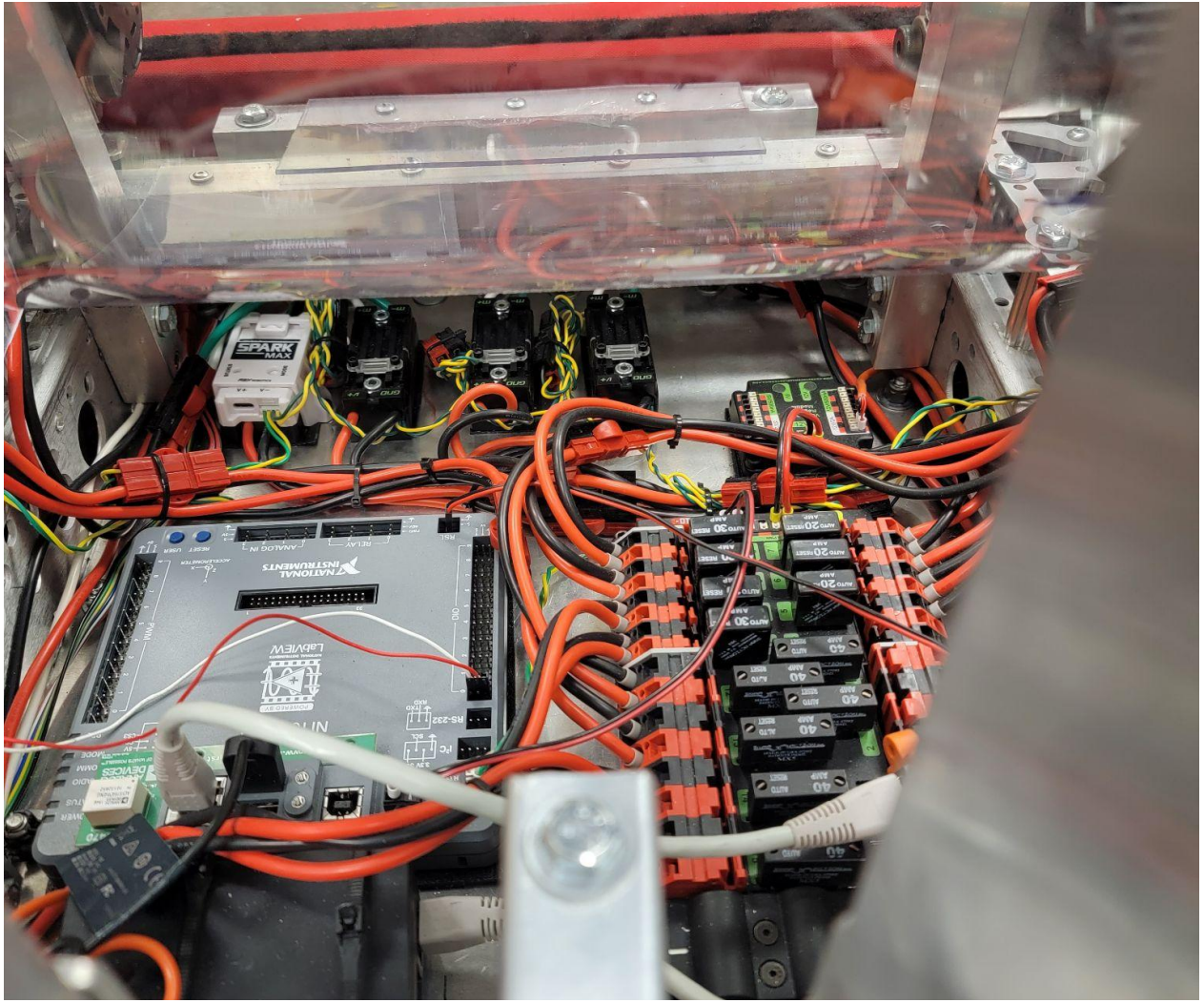
Progress through the season

Late season

- Complications with the elevator led to a crunch on time
- Worked on wiring and shooter mechanism
- Wiring
  - Motor controllers
  - Power Distribution Panel
  - Voltage Regulator Module
  - RoboRIO
  - Wireless Access Point
- Shooter
  - Belts and pulleys
  - Rubber wheels
  - Polycarbonate arc (used to maintain contact of wheel on ball)






SPARK MAX
NATIONAL INSTRUMENTS
LabVIEW

Competition

- Northern Lights Regional Qualifier
  - Duluth, MN
  - 53 teams

- Our Team
  - 7 Students
  - 3 Mentors

- Exposure to 110 other teams
  - Shared venue with Lake Superior Qualifier

44th/53

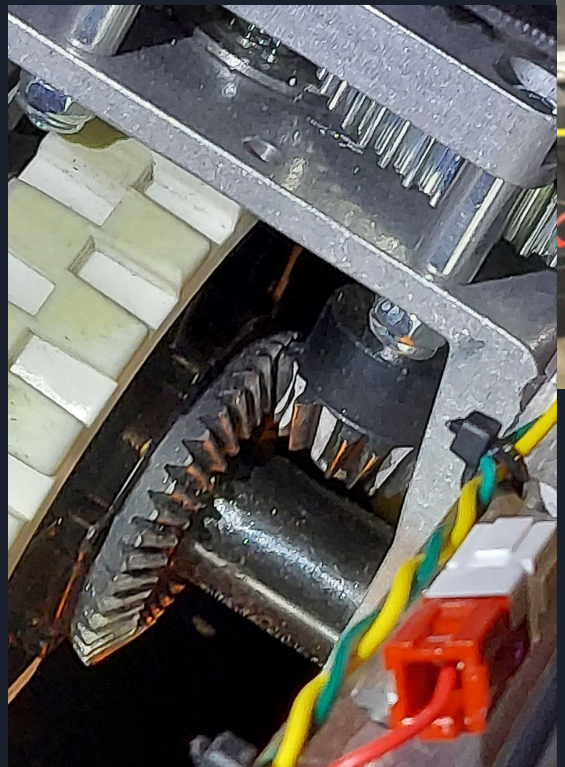
At Northern Lights Regional, we placed 44th out of 53 teams…

… but there's a lot behind this placement.

Setbacks

- In the first few rounds…
  - We peaked 14th overall
  - Had successful shooting
  - Consistently Climbed
  - Effectively played offense and defense

- As the competition continued…
  - We had a wheel break down
  - Frame bending issues
  - Inconsistent shooting
  - Unfortunate matchups



Post season

- Continuing to grow support for the team
  - Presenting to 8th graders
  - Working with community on STEM related projects
- Planning and prepping for next season
  - Analyzed what we did good, what we could improve

Questions?

Jordan Montgomery - Executive Director

Email: jordan.montgomery@jvrobotics.org